Personal Protective Equipment for Women

Addressing the Need

Ontario Women's Directorate

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A Change Agent Project by the Ontario Women's Directorate and the Industrial Accident Prevention Association

Ontario Women's Directorate

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Industrial Accident Prevention Association
Ontario Women's Directorate

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The Change Agents

Change Agents are trendsetters. They are the unions, employers, employer associations, workplace health and safety organizations, and community groups who work with the Ontario Women's Directorate (OWD) to turn innovative ideas on employment equity into real gains for women.

In 1986, the Ontario Women's Directorate launched the Change Agent Program to encourage the development of employment equity programs in the workplace. Through case studies, publications, videos and other resources, the Change Agent Program has made available an impressive array of resources to employers and others.

Sharing these resources is one of the primary objectives of the Change Agent Program. The Ontario Women's Directorate is pleased to add this publication, ***Personal Protective Equipment for Women: Addressing the Need***, to its list of employment equity materials. For more information on the Change Agent Program, please contact:

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About This Publication

The limited availability of personal protective equipment (PPE) for women is a critical workplace health and safety issue. In addition to undermining efforts to protect worker health and safety, lack of adequate PPE can be a barrier to equality of employment opportunity for women. Ill-fitting protective clothing and equipment can also mean that women entering certain 'non-traditional' fields will be unable to perform efficiently the given tasks of the job.

To address these issues, the Industrial Accident Prevention Association and the Ontario Women's Directorate have jointly developed this publication. The document is divided into two main sections. The first part looks at PPE from a variety of angles:

- how women have been coping with the lack of adequate PPE
- what they and others have to say about possible improvements
- what is being done
- who is responsible for protection
- what motivates manufacturers and suppliers.

The second part is a directory that lists some manufacturers and suppliers who are able to meet the PPE needs of women workers. The directory is extensive but not exhaustive. Like the narrative portion of the publication, it indicates the availability of some PPE for women. The kinds of protection covered by this publication are those most commonly worn by working women. They include:

- body
- eye/face
- foot
- hand
- head
- hearing.

Who is this publication for? If PPE is the hub of the wheel, there are many spokes. Not only users, but employers, unions, workplace health and safety organizations, and manufacturers and suppliers are part of the diverse audience this publication aims to reach.

While resources did not enable us to fully address the PPE needs of women, our intent is to make a difference. Indeed, our expectation is that the publication will generate sufficient interest for subsequent updates, the inclusion of more manufacturers and suppliers, and expansion to include other areas of protective equipment (for example, fall protection, respiratory protection).

The Changing Workforce

It's hard to imagine there was a time when most employees in Canada were men. And yet, if we look back about 20 years, women made up only one-third of the labour force, according to Statistics Canada. By 1988, this figure jumped to 44 per cent. By the year 2000, close to half of Canada's labour force will be female.

Women bring with them specific employment equity issues. These include the need for:

- equal pay for work of equal value
- freedom from sexual harassment
- integration in all occupations at all levels
- access to proper fitting personal protective equipment.

The latter is particularly critical for women in 'non-traditional' occupations, such as plumbers, steamfitters, welders, electricians and carpenters. These are jobs where women make up less than one-third of the total workforce in that job category. It was not until the 1970s that women began to enter male-dominated workplaces in significant numbers. The economy had changed so that two incomes were now necessary. Some women were attracted by non-traditional jobs requiring new skills, challenges, and better pay than traditional female-dominated occupations.

What women found were workplaces geared to predominantly white male employees. Manufacturers and suppliers of personal protective products produced and sold items suitable for this white male workforce. Now this scenario is outdated, not only because of the increase of women workers, but also because changing immigration patterns have resulted in the employment of males from various ethnic groups, some of whom are smaller in stature than white males.

Opportunities for Women in Ontario

Trends in the Ontario labour force indicate that throughout the 1990s, there will be fewer youth, an increase in the numbers of prime-age workers (25-44 years of age), and a continued increase in the proportion of women entering the labour force.

At the same time, there is concern in the industrial and construction sectors that in certain high-skill occupations, employee shortages will occur. The concern is well justified: In 1988, the Ontario Ministry of Skills Development estimated that more than 150 occupations face skill shortages. This could translate into opportunities for women. Indeed, some employers are already training and apprenticing women to meet the labour market demand of the future. Employment equity initiatives are also expected to have an impact on employers in terms of recruiting women to achieve equitable representation.

Since the 1970s, more women have been choosing occupations in the skilled trades and other industrial sectors – areas which still employ mainly men. Today, in the 286 non-traditional occupations cited for women in Ontario, nearly 14 per cent of the workforce is female. This figure may not seem startling, but it does show an important upward trend. Also, in keeping with reported labour force trends, women in non-traditional occupations tend to be in the prime-age group (25–44 years). Often this is because they turn to these jobs after working in traditional "female" jobs.

The IAPA–OWD Project: Responding to the Need

This publication is the result of a joint project between the Industrial Accident Prevention Association (IAPA) and the Ontario Women's Directorate. The idea for the project came from a series of consultative sessions on the Change Agent Program. Conducted by the Ontario Women's Directorate in the spring of 1989, the sessions included representatives from labour organizations, community associations, and employers. Workplace health and safety issues affecting women (particularly the apparent scarcity of proper fitting PPE) were some of the topics raised by participants.[1]

The Ontario Women's Directorate welcomed the opportunity to act on a number of suggestions made during the consultation process. The Directorate also welcomed the IAPA's partnership in this project.

Project Objectives

This Change Agent publication was designed to meet the following objectives:

- to increase awareness of workplace health and safety issues and their impact on women workers
- to identify existing sources of personal protective equipment for women (e.g., PPE manufacturers and suppliers)
- to identify the issues and needs which should be addressed by employers, workers, unions, PPE manufacturers and suppliers, and others
- to provide information which can be used by policy makers, advocacy groups, labour organizations, employer associations, safety associations, and others to substantiate the seriousness of the health and safety problems resulting from the lack of adequate personal protective equipment for women workers.

A volunteer advisory committee was established in order to:

- help identify relevant issues and their impact
- help identify research sources
- help formulate recommendations, such as the selection criteria for the listing of PPE manufacturers and suppliers
- review and comment on the publication text.

The members of the Advisory Committee included:

Shirley Fowlin, Employment Equity Consultant, Ontario Women's Directorate

Sue Hanel, Occupational Health & Safety Specialist, The Oshawa Group Limited

Caroline Hoevenaars, Women's Access to Apprenticeship Coordinator, West End Machining

Teresa Holden, Research Consultant, Industrial Accident Prevention Association

Karen McMahon, Shift Handiperson Mechanical, Ontario Hydro

Kevin Stewart, Project Scientist, Safety Services, Canadian Centre for Occupational Health and Safety

Ilene Stones, Project Scientist, Safety Services, Canadian Centre for Occupational Health and Safety

1. At the same time, the IAPA was conducting its own research which clearly pointed to the difficulties that employers experience in locating suitable PPE for women.

John Vander Doelen, Manager, Ergonomics Unit, Health & Safety Support Services, Ontario Ministry of Labour

John Watson, Project Manager, Occupational Health & Safety Standards, Canadian Standards Association.

While every effort was made to ensure that the advisory committee was representative of the major stakeholders, the project was unable to engage the participation of representatives from organized labour. Labour representatives did, however, participate on a consultative basis during the research phase of the project.

Finding the Facts

Over 100 manufacturers and suppliers of PPE, both in Canada and the United States, were surveyed by mail. (For more information on the survey, see the next section.) As well, interviews were conducted in person and by telephone with 35 key stakeholders. These included:

- women who wear personal protective equipment in their work
- representatives of employers and unions
- PPE manufacturers and suppliers
- other participants representing government, standard setting agencies, and specialists in the area of personal protective equipment issues relating to women.

About the Survey of PPE Providers

To compile the directory of providers of personal protective equipment in women's sizes and in size ranges suitable for women, we surveyed over 100 PPE manufacturers and suppliers. These companies were selected from the *Occupational Health and Safety Canada – 1990 Buyer's Guide*. Any company that provided at least one of the following types of protection most commonly worn by women was targeted for the survey:

- eye/face
- foot
- hand
- head
- hearing.

Subsequently, body protection was added in response to the concerns of some of the women interviewed, as well as the findings from the survey of PPE providers.

Almost two-thirds of the companies surveyed returned a completed questionnaire. The responses to the survey were verified through random telephone follow-ups, on-site visits to respondent companies, and interviews with users and buyers of PPE. However, this does not rule out the possibility of errors in the completion of the questionnaire, particularly errors relating to the difference between small men's sizes and sizes specifically suitable for women.

Women and Personal Protective Equipment

Personal protective equipment is considered to be the last line of defence against hazards in the workplace. Advocates for workers in high-risk occupations emphasize the continuing need to control or eliminate hazards, rather than require workers to protect themselves with personal protective equipment. For example, hearing protectors eliminate or reduce the chances of hearing loss (provided they fit, are appropriate, and are used properly), but they do not eliminate the hazard - in this case, noise. PPE will, however, continue to be required in many work situations:

- as an interim measure before controls are implemented
- where control technology is not available
- where controls are inadequate
- during activities such as maintenance, clean up, repair, materials handling, and storage
- during emergencies
- wherever there is the hazard of injury to the body
- on construction sites.

Trying to Fit into the Workplace

In many cases, women requiring personal protective equipment are forced to 'make do' and wear equipment designed for men. Some women, particularly those who work in all-male sites, are reluctant to draw attention to their special needs. With a relatively small female component in occupations that are non-traditional, many manufacturers are reluctant to invest in the necessary research and development to produce correctly sized and proportioned products. The result, ill-fitting protective equipment, can jeopardize the health and safety of female workers and their co-workers. Here are some examples:

- A woman with a small face wears the goggles available in the shop. The gaps they leave at her temples allow flying debris from her machine to enter her eyes.
- A female worker in a sawmill can only get small men's-sized gloves; the fingers are too long and too wide, the palm area too large, and the cuff allows sawdust to fill the fingers. She risks getting her fingers caught in machinery and pinched when she stacks or carries boards.
- A woman who wears men's-sized work boots complains of tripping while walking and climbing stairs or ladders. She suffers from blisters and burning on the soles of her feet. Also, because her boots are too large, her toes are not protected by the steel cap.

As these examples clearly show, ill-fitting personal protective equipment does not protect at all. Moreover, it poses an unnecessary risk to the health and safety of the women wearing it.

In addition, men and women, whose protective equipment does not fit or is uncomfortable to wear, tend to avoid using it regardless of the risk involved.

And, employers concerned about the health and safety of the worker, may be reluctant to hire or promote women whose safety is at risk.

Equal – but Different

Anthropometry is the science that measures the human body to determine similarities and differences among individuals and groups. Anthropometric tables have been created which clearly show that women are not small men. Indeed, women are different in a variety of ways. For instance, on average, a woman's foot is shorter and narrower than a man's. Thus, if a manufacturer were to simply reduce the average man's footwear pattern size to accommodate the smaller foot of a woman, the length might be correct, but the shoe would still be too wide.

No wonder men's coveralls don't fit most women. The average woman's body is shorter in length, making men's coveralls too long in the torso. Her shoulders are narrower, which makes the sleeves too long. And women are usually wider at the hip.

A woman's hands are smaller – she has shorter, narrower fingers and a smaller palm circumference – so even a man's small size glove often does not fit.

The average woman has a smaller head and face circumference than the average man. This affects the fit and comfort in head, eye and face, and respiratory protection.

The Wearwithal to Change

Women differ from men in size and shape and so should the dimensions of their PPE. Some areas of protective equipment need to be specifically designed for the female worker to ensure proper fit, comfort and protection. These include: head, eye/face, body, hand and foot protection. It should be noted that not all women are small in build. And for these women, some men's sizes can provide a reasonable fit. Likewise, there are small men who experience problems with the fit and comfort of their PPE and would benefit from a wider range of sizes.

In other PPE areas, such as hearing protection, simply providing a wider range of sizes would meet the needs of the workforce.

Personal Protective Equipment: From Head to Toe

This section provides an update on the personal protective equipment available to women. It also identifies the issues surrounding proper fit and comfort, as reported in the interviews with key participants. And, it offers practical tips on selecting, using, and maintaining PPE.

Women cannot hang various pieces of equipment on themselves as if they were Christmas trees. Gear must be compatible. Hence, the following questions need to be answered:

- What is the degree of protection required? (e.g., is full hand and arm protection required or will gloves do?)
- What other pieces of PPE must be worn? (e.g., head and eye protection, head and hearing protection)
- What type of clothing will be worn? (e.g., parkas, rain wear)
- What tools or equipment must be used or operated?
- What types of work postures or positions are required by the job? (e.g., frequent bending over or looking overhead)
- What are the environmental factors? (e.g., extreme heat or cold)
- What are the human needs? (e.g., comfort, fit).

A Good Head Start

Safety (or hard) hats are considered standard protective equipment in many workplaces where personal protective equipment is required. They are intended to protect the head from injuries caused by impact, penetration or electrical shock. Generally, hard hats are fitted with an adjustable headband.

In Canada, safety hats are certified by the Canadian Standards Association (CSA). (In the United States, the American National Standards Institute (ANSI) approves standards for protective headwear.) The CSA standard applies to various classes of protective headwear; it does not, however, apply to bump caps. In early 1990, the CSA eliminated its requirement for adjustable headbands to cover a specified range of hat sizes. This change is having a positive impact on the availability of better fitting headgear for women. Now, manufacturers can produce smaller-sized headgear that still meets the CSA standard.

What to Look for When Choosing a Hard Hat or Cap

- Does the hat protect you from the hazards of the job? (e.g., high voltages)
- Does the headband fit? (The hat or cap should stay on while you bend over. Yet, it should not be so tight that the band makes marks on your forehead.)
- Is an adjustable chin-strap necessary?
- Does the hat feel too heavy? If so, try another brand.
- If in doubt, ask a qualified person to check the fit.

Most of the women interviewed reported no problems with fit; however, women with smaller heads had difficulty locating safety hats with a smaller crown strap suspension system. Those who had worn hard hats that were too large, discovered that adding a chin-strap provided a better fit.

Women also reported that when they had to wear additional PPE, such as ear-muffs, they were less satisfied with their headgear. Often the added equipment created an imbalance on the head or became very heavy by the end of a full shift, causing headaches and general discomfort.

Tips on Safe Use and Maintenance

- Check the shell and suspension of your headwear for damage before each use. Look for signs such as cracks, dents, or gouges, chalky appearance, and torn or broken suspension threads.
- Do not wear your hard hat backwards unless it is necessary to fit with other gear such as welder's equipment.
- Do not paint the plastic shell or alter it in ways that may reduce head protection.
- Be aware that long-term exposure to sun, perspiration, hair oils, heat, or chemicals may reduce the protection offered by the hat or cap.
- Replace hard hats which have been struck or dropped from heights, even if no damage is visible.
- To ensure maximum protection, replace the outer shell every five years and the suspension annually.
- Do not use winter liners that contain metal or other materials that can conduct electricity.
- With Class B (high-voltage protection) headwear, do not use metal labels; also, do not pull the chin-strap over the brim or peak.
- Clean the suspension and shell regularly. (Use a mild dish soap and a wet sponge or soft brush. Rinse thoroughly with water.)
- Store headgear in an appropriate area, away from heat and direct sun. Do not store it on the rear window ledge of a car. (It can become a dangerous projectile in an emergency stop or accident.)

Protection

Do the Eyes Have It?

Safety glasses, both non-prescription and prescription, are common pieces of protective equipment. Some look like regular glasses, others require side shields.

Safety goggles of various types are used for specific tasks such as grinding, woodworking, degreasing, chemical spraying, and gas cutting and welding.

While non-prescription eyewear is provided for by the employer, prescription eyewear is usually paid for by the employee and subsidized by the employer through an employee medical benefits plan, eyewear allowance, or union contract.

Safety Standards

Safety standards cover various kinds and classes of eye and face protectors including: glasses with and without side shields, eyecup goggles, monoframe goggles, welding helmets, and face shields. When it comes to safety glasses, CSA will certify frames, but not glass lenses since glass does not pass impact tests and can be hazardous in certain work environments. Also, CSA will certify safety frames, but not prescription lenses since, to be certified, each prescription lens would have to be individually tested and could be weakened in the process. Non-prescription (or plano) lenses are approved for certification by CSA.

Prescription safety glasses are usually fitted by an optometrist. As such, they are less likely to pose problems with fit. Non-prescription safety glasses, however, can create difficulties for the worker with a small face: glasses may be too wide across, too long at the temple, and too big in the bridge area, causing them to slide down the nose and fall off. Most of the women interviewed did not report difficulty obtaining the proper size – if they had a variety of manufacturer's products to choose from.

Goggles: Eye–To–Eye Safety

Women who wear safety goggles often have a greater problem with fit and comfort. Some goggles manufactured as "one size fits all" may be too big. This can be a serious health and safety hazard if gaps around the seal to the face allow flying objects, and particles, sparks, chemicals or other hazardous substances to enter the eye area. Fogging of the lenses (from poor ventilation) is common and can lead to accidents: Mishaps can occur if the wearer takes her goggles off to clear them and is hit by flying debris, or if she cannot see well enough to do her work properly.

What to Look for When Choosing Safety Glasses and Goggles

- Ensure that the safety eyewear is appropriate for the hazards of the job.
- Have a qualified person assist in the proper fitting of protective eyewear. Special attention must be paid to the eye, bridge, and temple areas.
- Check for glasses that are secure and comfortable. (If the glasses slip down the nose when the head is tilted downward, they are too big.)
- Check the weight - polycarbonate lenses tend to be lighter and therefore more comfortable to wear.
- Ensure the side shields do not obstruct peripheral vision.
- Look for goggles that seal against the face; there should be no gaps.
- Look for goggles that have an adjustable strap. Do not pull the strap so tight that the lens distorts your vision or the goggles hurt your face.
- Have your eyes checked annually by a doctor to determine if and what kind of prescription eyewear is needed.

Style is not a safety feature. But a range of styles can encourage workers (both women and men) to use eye protection. This is especially important with a younger, fashion-conscious labour force.

Tips on Safe Use and Maintenance

- Clean lenses daily. Follow the manufacturer's instructions.
- Inspect lenses and frames regularly for pits, scratches, and cracks.
- Report broken, damaged or ill-fitting eyewear to your supervisor immediately so that it can be repaired or replaced. Lenses should be replaced after serious impact.
- Store safety glasses in a proper case to prevent damage. Insert them so that lenses face away from the metal backing inside the case. Never store glasses in a tool box.

Hearing Protection

Sound Advice

There are two basic types of hearing protection devices – ear-plugs and ear-muffs. If adequately fitted, either can give good protection. However, there are some circumstances in which one may be better suited than the other. For example, ear-plugs may be better in hot, humid or confined work areas. They may also be better for employees who must wear other PPE, such as safety glasses or hats.

Ear-muffs may be better suited for the individual who moves in and out of noisy work areas because the muffs are more practical to remove and put on.

In some work situations, workers may be required to wear both plugs and muffs (e.g., air arc welding).

Hearing protection is standardized and certified by the CSA. There are three classes of hearing protectors: Class A, B, and C. Class A protectors provide the highest degree of protection from noise; Class B and C provide lower levels of protection.

When interviewed, the majority of women said they favoured the disposable, foam-type ear-plugs which are less likely to cause size problems. By comparison, the pre-moulded types were more uncomfortable.

Those women with very small ear canals reported difficulties in locating their size.

What to Look for When Choosing Hearing Protection

- Does the hearing protector provide adequate protection against the noise levels on the job?
- Does the ear-plug provide a tight seal within the ear canal?
- Does the ear-muff provide a tight seal against the side of the head?
- Does the headband collapse enough to snugly fit the head?
- Do the ear-plugs or muffs feel comfortable enough to be worn throughout the shift? (If too large or too heavy, they will cause discomfort.)

A Leading Example

One participant noted that her supervisor was almost hearing impaired. After years of working on the job without using hearing protection, he was unable to hear properly for 12 to 18 hours after work. She began to wear ear-plugs, and other workers on the crew followed her example. Other female participants reported similar experiences on their worksites.

Tips on Safe Use and Maintenance

- Follow the manufacturer's instructions for getting a proper fit. It is best to have a qualified person demonstrate.
- Ensure that hands are clean when inserting ear-plugs.
- Do not alter hearing protectors (e.g., by removing flanges on pre-moulded plugs or by drilling holes in them or making other adjustments which may reduce their effectiveness).
- Check hearing protectors regularly for wear and tear. (Flanges on plugs may break and plugs may harden or crack. Ear-muff cushions may harden or crack, and headbands may lose their tension.)
- Report damaged or worn hearing protection to your supervisor immediately so that it can be repaired or replaced.
- Replace disposable ear-plugs after each use, reusable plugs at least every 6 months, and ear-muff cushions at least every year.
- Follow the manufacturer's directions for proper care and storage of muffs and plugs.

Gloves

A Hands-on Approach To Safety

Different types of protective gloves[1] are used for a variety of jobs. There are cotton gloves for materials handlers, chemical-resistant gloves to protect those who work with chemicals, leather gloves for welders, metal-mesh gloves for meat cutters, and ballistic nylon gloves for chain-saw users.

Gloves are manufactured for different occupations and environments: for extreme cold in freezers or outdoors in winter, for extreme heat in welding, for lint-free, high technology areas, and for radiation-protection in nuclear plants.

What to Look for When Choosing Safety Gloves

- Choose hand protection that is appropriate to the hazards of the job.
- Ensure all exposed skin is covered by the gloves.
- Check that the glove's finger length and width, and palm circumference are correct.
- Make sure that your gloves allow skilled and easy use of your hands; gloves should not be clumsy or awkward to wear.
- Ensure that the glove offers a safe grip to prevent tools or materials from sliding out of your hand.
- Gauntlets or wristlets should fit over clothing and be streamlined to the arms to prevent gloves from catching on machinery or debris from falling inside.

CSA has not set standards or certification tests for gloves. (In the United States, gloves are approved by the U.S. Drug Administration.) In some workplaces, gloves are approved by the joint health and safety committee. In others, employers set their own standards to ensure their workers are adequately protected.

1. While gloves are the most popular form of hand protection, there are other types, such as mitts, hand pads, finger guards, cots, and thimbles.

One Size Does Not Fit All

Ill-fitting gloves were the single, greatest problem noted by the participants. As one woman remarked,

"I tended not to use them unless I had to because they were so awkward."

Many women said they simply make do with gloves that do not fit: the fingers are too long and too wide, the palm circumference too large, and the gauntlet or wristlet too big.

Correct sizes are hard to find; at many worksites, participants noted, only men's large and extra large gloves are stocked. This is a problem for both women and for men with smaller hands. It's clear that one size does not fit all. Indeed, there seems to be a substantial market for alert manufacturers.

How Have Women Coped?

Gloves may not come in many sizes, but adaptation does. In some cases, it has painful and dangerous consequences:

"I stuffed cotton in the fingers, put tape at the wrist, and tacked the top with staples to stop sparks from getting down the sleeve... I put up with a lot of ridicule from my co-workers too."

"I cut off the long fingers and froze to be safe on the job."

"I had an accident with loose cotton gloves using a grinder and broke my finger before the right size was made available."

As we can see from these examples, ill-fitting gloves do not provide adequate protection. Moreover, they may expose workers to additional risks. This is especially true when the job involves handling power saws, knives, welding torches, heavy materials, or hazardous liquids, such as acids and corrosives.

Improperly-fitting equipment can also detract from a woman's ability to do her job. It may lead to:

- less efficient work (e.g., over-sized gloves may cause a worker to grasp a tool tighter than she should in order to get a good grip)
- slower work (muscular fatigue and frequent readjustments of gloves can slow a worker down)
- greater number of errors
- difficulty in doing certain tasks (e.g., jobs requiring fine, detailed movements).

Tips on Safe Use and Maintenance

- Inspect and test new gloves for defects (e.g., tears, leaks) before using.
- Report damaged or worn gloves to your supervisor immediately so that they can be replaced.
- Do not wear gloves near moving machine parts; they can become caught.
- Do not wear gloves with metal parts near electrical equipment.
- Wash off chemical-protective gloves with water before removing them.
- Follow the manufacturer's instructions for care and maintenance.

Foot Protection

These Boots are Made for Working

Safety footwear is designed to protect against the most common causes of foot injury – impact, compression (being crushed) and puncture. There may be additional hazards which a worker needs to be protected from, such as static electricity, sparking, live electricity, corrosive materials, wetness, slipping, cold, heat, hot sparks and molten metal. These require special protection; for example, steel-toe rubber boots, chain-saw boots, and metatarsal guard boots (which protect the top of the foot behind the toe).

What to Look for When Choosing Foot Protection

- Make sure that your footwear is appropriate to the hazards of the job.
- When trying on new boots, wear the number and type of socks (preferably, wool or cotton), insoles, etc., that you would normally wear on the job.
- Check the distance between your toe and the toe of the boot. To do this, push your foot to the front of the boot (while standing) and check the space difference at your heel (since it is impossible to feel the end of the toe wearing a steel cap). Allow at least 3/8 inch space.
- Allow room for swelling (about 1/8 inch), especially if you stand or walk all day on the job.
- Make sure the boot/shoe fits comfortably but snugly around the heel and ankle areas when laced. It should also fit comfortably at the ball of the foot.
- Walk around in new footwear to ensure it is comfortable.
- Choose footwear that is as light-weight as possible. (Remember, though, that safety footwear is generally heavier than regular footwear.)

All safety footwear is classed as Grade I, II, or III by the Canadian Standards Association. These grades refer to the toe-cap's ability to withstand impact. Grade I footwear offers the greatest protection and will display a green label. Grade II footwear (with a yellow label) provides medium protection. Grade III (red label) provides light protection.

A Step in the Right Direction

Only in recent years have the issues of size, fit and comfort of women's footwear been seriously addressed. In 1989, the CSA revised its safety footwear standards to allow shoe-makers to manufacture Grade I boots in narrower widths without sacrificing the level of protection offered to workers with small feet. The change now allows for the amount of clearance between the toe-cap and the toes after an impact test to vary according to the size of the toe-cap. (Originally, the amount of clearance had to be the same regardless of toe-cap size.) These changes have had a positive impact in increasing the availability of women's safety footwear. Many manufacturers now produce women's sizes in a regular work boot.

Some manufacturers are also using women's lasts. A last is a mold of a foot. By using women's lasts, which come close to the actual size, shape and bone structure of a woman's feet, manufacturers can make foot protection for women that is more comfortable and better fitting.

However, there are indications that a large number of women are still "making do" with men's footwear. Wearing boots that are too big, they are left unprotected from the hazards of the job. These women risk additional injury from tripping, slipping and falling, as well as suffering from blisters, burning soles and sore feet.

Safety footwear in women's sizes is particularly limited for women who live outside large urban centres or who rely solely upon supplics at the

workplace (employer stores or boot trucks). Larger employers are better able to muster the resources to locate women's sizes; smaller employers are more likely to expect employees to adjust to the products available.

While manufacturers and suppliers have begun to meet the needs of female workers who wear the standard safety work boot, little is available in women's sizes in chain-saw boots (for loggers), metatarsal guard boots (for those in heavy-material handling, steel fabrication, and pulp and paper and logging operations), and cold weather boots (below 0 degrees Celsius).

When it comes to safety footwear, men have a variety of colors and styles to choose from, unlike women. Women's styles are rarely available in black, and there are no safety dress shoe styles for the female executive or manager. This is important for the individual who might be required, in one day, to go from the office to the plant or construction site.

Wedge heel styles in safety footwear may be suitable for some worksites and situations, but not for all. Image and fashion may seem frivolous where safety is concerned; but as with most items of protective clothing, footwear is more likely to be worn if it is fashionable.

Tips on Safe Use and Maintenance

- Lace up boots fully to provide support against ankle injury.
- Wear natural fibre socks (cotton or wool) for increased comfort.
- Consider using shock-absorbing insoles to help relieve discomfort in your back, legs, and feet.
- Inspect your footwear regularly for damage.
- Keep the outsole free of stones, tacks, nails, and other debris.
- Replace footwear if the steel toe-cap is exposed, becomes loose or dented, or if the sole grips are worn.
- Follow the manufacturer's instructions for proper care and maintenance of your footwear. (This includes cleaning and waterproofing.)

Bodyguards

All Over Protection

Overalls, coveralls and jumpsuits are commonly worn in a wide variety of jobs. They can provide protection from such hazards as asbestos, toxic chemicals, water, dirt, and grease. Bullet-proof vests are worn by police, bomb suits by the military, and nuclear suits by people exposed to nuclear hazards. But from the common to the custom made, body protection equipment is rarely geared to women.

What to Look for When Choosing Protective Clothing

- Ensure that the body protection is suitable for the hazards of the job.
- Try clothing on and walk around in it. Make the moves that you normally would do while on the job.
- Check that torso length is sufficient when stretching, reaching, sitting, and bending over.
- Check for proper fit at the shoulders, chest, waist (preferably elasticized) and hips. Pay particular attention to sleeve and pant lengths.
- Ensure that shortening sleeves and pants by cutting and hemming does not reduce the degree of protection offered.
- Look for freedom of movement. Make sure that the material doesn't bunch up.

Gender differences in body shape generally require that protective clothing be specifically designed for women. The areas most important for consideration include: torso or trunk length, shoulders, chest/breast, waist, and hips. The many women who wear men's clothing have problems (too tight in some areas, too long and too baggy in others) that restrict the ability to move easily and

in some cases, the ability to work safely. For example, chain-saw pants that are too large are dangerous to a female worker because the ballistic nylon strips could turn while working and leave her legs unprotected. Such poor fitting equipment also tends to reduce the productivity of the woman while she compensates to do her job safely.

Modifying protective clothing can be equally dangerous. For example, rolling up excessively long sleeves or pants can create excess bulk which can, in turn, increase the risk of becoming caught in machinery. This is especially true when working in areas where space is limited. And, as our participants reported, this can and has caused accidents to women.

Tips on Safe Use and Maintenance

- Follow manufacturer's directions for care and maintenance of the garment.
- Report worn or torn protective clothing to your supervisor for repair or replacement.

Some types of body protection cannot be safely modified and are not available in women's sizes. Two examples are asbestos removal coveralls and chemical-resistant body suits.

In addition, the practical problems of toilet use for women need to be addressed. It is often necessary for women to empty pockets and remove other protective equipment such as gloves, belts, and other gear. This is even more uncomfortable in a small portable toilet. Of all the manufacturers surveyed, only one (as listed in the directory) has addressed the need for a "drop-seat" in coveralls for women.

Currently, there are no standards set for personal protective clothing; however, CSA has recently (mid-1990) begun to organize a standards-setting committee to develop standards and testing for certification. In the United States, ANSI has set standards for garments.

Summary

The Long and Short of It

The entrance of women into male-dominated occupations has only recently made PPE for women more available. This has been most clearly seen in the areas of head and foot protection. A transitional period has begun, and with it an emphasis on a wider range of sizes, greater comfort, and a stronger pitch to buyers. And yet, there is still much to be done when it comes to making proper-fitting PPE available to women. As one supplier noted,

"Smaller workers are an untapped, non-fitted market."

Those manufacturers and suppliers who have either made all or some of their PPE products available in women's sizes, or expanded the range of sizes, are listed in the directory at the end of this publication.

What are the factors which motivate the manufacturing and marketing of PPE? Who decides if PPE is safe? The next section explains who the major players are, what their roles are, and what more each could be doing to meet the challenge of personal protective equipment for women.

Making Changes

Several decision-making groups have a say about the adequacy and appropriateness of PPE for women workers: government, standards-setting agencies, PPE manufacturers and suppliers, safety associations, employers, joint health and safety committees, unions – and the women who wear PPE in their work.

Of course, the first line of defence is to remove or control the hazard. When the hazard can't be removed or controlled adequately, personal protective equipment must be worn. As such, PPE is the last resort to keeping workers healthy and safe. But PPE that does not fit properly is no defence at all; neither is PPE that is not worn because it is uncomfortable, awkward or unsafe.

What the Law Says

Ontario's Occupational Health and Safety Act (OH&S Act), which is administered by the Ministry of Labour, is intended to protect workers against health and safety hazards on the job. The Act sets out the rights and duties of all parties in the workplace. It also establishes procedures for dealing with workplace hazards, and it provides for enforcement of the law where compliance has not been achieved voluntarily.

Under the OH&S Act, workers and employers must share the responsibility for workplace health and safety. The concept of an "internal responsibility system" is based on the principle that parties in the workplace are in the best position to identify health and safety problems and to come up with solutions. The cornerstone of the internal responsibility system is the joint health and safety committee. (For more information on joint health and safety committees, see page 29.)

Among other things, employers are responsible for making personal protective equipment available and maintaining it in good condition. They are not obligated to pay for it, however.

Workers have the responsibility to use or wear the equipment or clothing required by their employer. They must also report to the employer or supervisor any protective equipment that may be dangerous or defective.

The Major Players:

Government

Regulating Health and Safety

The Government of Ontario has broad powers to make regulations to protect worker health and safety. These are detailed requirements for all workplace parties who may be affected by the subject of a regulation. For example, all workplace parties involved with construction projects must follow the regulations for such projects.

To ensure that the OH&S Act and regulations are being followed, and that the internal responsibility system is working, the Ministry of Labour has the power to carry out workplace inspections.

Government also has the power to set penalties for non-compliance and to shut down or stop equipment or processes and fine any person for violations.

What Participants Said About Government's Role

Participants identified a number of ways in which government can help to improve the PPE situation:

- Increase the number of government inspectors to ensure that the Act and regulations are being complied with.
- Increase fines to foster compliance. (Some feel that fines are "less than significant.")
- Exert pressure on employers to, in turn, pressure PPE providers into making women's equipment more available.
- Develop more regulations that are specification-based.[1]

Participants are optimistic that recent changes to the OH&S Act (under Bill 208) will address some of these concerns. For example, new powers have been given to joint health and safety committees and health and safety representatives (in smaller workplaces) to monitor the internal responsibility system. In addition, many more workplaces in Ontario are required to have committees. Also, fines have been increased for infractions. Finally, Bill 208 provides government inspectors with greater powers to enforce the OH&S Act and regulations.

1. Regulations can be either of a performance nature, where terms such as "appropriate in the circumstances" are used, or of a specification nature, where the details are spelled out. The approach that is used can influence whether the equipment supplied will or will not be appropriate to women.

When specifications such as "performance fit testing" are required, it will be very evident if the style of a respirator, for example, does not suit women. But when the requirements described are very general, assumptions can be made that the equipment will do the job it is supposed to do (whether the wearer is female or male, large or small). These assumptions may or may not be correct.

Standards-Setting Agencies

Putting Safety to the Test

The Canadian Standards Association (CSA) sets standards for personal protective equipment, tests products for certification, and monitors the manufacture of these products to ensure that standards are maintained. It is the principal agency in Canada that develops standards for incorporation into workplace health and safety laws.

The CSA has volunteer committees to write, review and revise standards. Committee members represent users, manufacturers, occupational health and safety associations, and government. There are separate committees for different types of protection (e.g., protective footwear, protective headwear, etc.). The CSA also liaises with similar agencies in the United States and elsewhere.

CSA standards have a direct impact upon the manufacture and availability of PPE for women. This has been most clearly demonstrated for two commonly worn types of PPE – head and foot protection. Under the old standards, women had to wear over-sized hard hats and safety boots in order to wear CSA-approved equipment. Now this has changed.

In the case of head protection, the standard was revised to eliminate the requirement for the headband to be of a minimum size (which was often too large for women). The new standard now allows for the manufacture of better-fitting headgear for women.

For protective footwear, the revised standard allows the amount of clearance between the toe-cap and the toes after impact to vary according to the size of the protective toe-cap. This change accommodates the manufacture of Grade 1 footwear in narrower widths which are more suitable for workers with smaller feet.

What Participants Said About Standards-Setting Agencies

What changes do the participants who were interviewed think are most urgent? The following are some of their concerns and recommendations on PPE standards and certification:

- Standardize certain types of protective gloves, such as welder's, chain-saw, chemical resistant, and cut resistant.
- Review existing standards to ensure that they do not have an adverse impact on certain segments of the labour force (e.g., women, and other designated groups). In reviewing standards or setting new ones, consider the make-up and needs of the current labour force, as well as the labour force of tomorrow.
- Review and upgrade standards as technology changes; include requirements which address compatibility with other protective equipment, work environment and tasks, as well as worker needs.
- Use ergonomics, based upon anthropometric data (that include comfort, fit, and adjustability and the special needs of women workers) in all standards and certification tests.
- Ensure that female users of PPE are represented on CSA Committees.
- Improve the methods of processing product certifications and of revising standards. (Currently, delays affect manufacturers, who need approval to pose bids on distribution, and suppliers, who must wait for the product to sell.)

PPE Manufacturers

Safer By Design

"By tapering the sleeves and mitts, we have made them fit better. The result has been more comfort, greater protection and more orders."
– Survey respondent.

"By definition, it is only PPE if it fits both the person and the job. That is why we encourage our customers to detail their exact needs."
– Survey respondent.

Close to 75% of the manufacturers and suppliers surveyed reported increases in requests over the past three years for PPE in women's sizes or in size ranges suitable for women. Of this group, over one-third reported significant increases.

Manufacturers play a crucial role in the provision of PPE. The range (or lack) of sizes and designs can affect, not only how women are protected, but how well they are able to do their jobs.

The cost of new product development is high, and manufacturers want to know there is a sizeable demand in order for them to get a return on their investment. This situation highlights the need for manufacturers to regularly assess their target market – the changing labour force. It also points to the importance of buyers communicating their needs to PPE providers.

Almost all manufacturers have PPE product catalogues. Their distribution systems range from on-site sales outlets, retail outlets, their own stores, mobile units (such as boot trucks), and mail order.

Employers and manufacturers sometimes work together to research and design new products for specific PPE applications. Manufacturers, who sit on CSA personal protective equipment committees, can play an important role by ensuring that revisions accommodate the changing labour force and include the needs of women.

While several manufacturers have begun to address the PPE needs of women, few have marketed their products in an aggressive way. And yet, there is a market out there: In the manufacturer's survey results, those who advertised their products in women's sizes, realized outstanding sales revenues. However, this fact seems little known.

What Participants Said About Manufacturers

Participants offered these suggestions to manufacturers to improve the availability of PPE for women:

- Encourage employers, female users and PPE suppliers to make their specific PPE needs known. Actively solicit feedback.
- Advertise and promote PPE for women in trade publications, at trade shows, and in product catalogues/brochures so that buyers know these products are readily available.
- When designing PPE used by women, use anthropometric and ergonomic data to ensure shape and size are appropriate.
- Consider light weight and easy maintenance when designing new products.
- Work with CSA to match standards to workplace needs.
- Broaden the distribution system to include rural, industrial communities, and target smaller employers.
- Work together with employers to research and develop new products to meet the needs of women.

PPE Suppliers

Meeting the Demand

"We recognize the trend towards PPE for women and would appreciate learning of manufacturers of such equipment."
– Survey respondent

Suppliers are in direct contact with PPE buyers (usually the purchasing department of a company), employers, and women workers. While the type of PPE made depends on the manufacturer, the supplier can anticipate needs by researching new sources of supplies to meet the changing requirements of customers. (The PPE Directory at the end of this publication can serve as a good base.) Particularly in "blue-collar" occupations, suppliers can expect to serve an increasing number of female customers; therefore, it's appropriate to include women's PPE in budgets and marketing plans. It is also important that suppliers who try to keep inventories low for economic reasons (but who nonetheless have ready access to PPE for women), advise buyers that women's sized PPE is available on request.

Suppliers, listing their most frequent requests for PPE in women's sizes (or in size ranges suitable for women), indicated that foot and hand protection are in greatest demand and eye protection comes a close second. These results are consistent with the findings from the interviews held with women users.

What Participants Said About Suppliers

Participants noted several ways that suppliers can better provide PPE to women:

- Encourage buyers to communicate their PPE needs and to voice their concerns about fit and comfort.
- Keep appropriate size ranges and product lines in stock, or ensure ready access to them, and advertise accordingly.
- Know what constitutes the proper fit for women; ensure sales staff are also knowledgeable.
- Tell manufacturers about gaps in PPE; if appropriate, work with them to make sizes and styles available to customers.

Workplace Health and Safety Organizations

United We Stand

In Ontario, there are a number of not-for-profit organizations that are committed to improving workplace health and safety. Funded by the Workplace Health and Safety Agency,[1] these organizations include eight accident prevention/safety associations (of which the IAPA is one), three health and safety programs, and the Workers' Health and Safety Centre.

These organizations offer a range of products, programs and services including: workplace consultations, health and safety audits, training and education, publications, audio-visuals, research, and other information services.

What Participants Said About Health and Safety Organizations

Participants suggested that there are several ways in which health and safety organizations can effectively impact upon the PPE needs of women:

- Actively participate on CSA Committees and raise the concerns about PPE for women.
- Educate member companies on the importance of proper-fitting PPE and the steps they should be taking to ensure protection.
- Continue to be or get involved in initiatives, such as the present project.
- Maintain the directory of PPE suppliers and manufacturers (as found in the back of this publication).
- Expand the directory to include other areas of protection, such as respiratory and fall protection.

1. The Workplace Health and Safety Agency was established in 1990 (under amendments to the OH&S Act), to give workplace parties a greater share in the direction of training, consultative work, promotion, and research in support of occupational health and safety in Ontario. The agency is jointly run by representatives of management and labour. Prior to January 1991, the safety associations and others were funded by the Workers' Compensation Board.

Employers

Their Job is Worker Protection

It is the responsibility of the employer to take every reasonable precaution to protect the worker. By law, the employer must ensure that personal protective equipment is made available, is used appropriately, and is maintained.

Workplace injuries and illnesses have costly consequences for employers. Most obvious are those costs related to compensating and treating the injured person. But there are also a host of "hidden" expenses related to lost time, productivity and production, and damage to material, equipment, and property.

Many employers take their responsibilities seriously and have initiated regular training and education seminars on health and safety issues, including PPE. Some employers have established comprehensive PPE programs which incorporate such elements as selection, fitting, maintenance, training, and on-going evaluation.

What Participants Said About Employers

The participants in this study offered these suggestions for employers on meeting the PPE needs of women:

- Undertake PPE needs surveys in the workplace to inquire about the problem areas of fit and comfort.
- Ensure purchasing departments seek out PPE providers who offer products in women's sizes or in size ranges suitable for women. (The PPE Directory is a good place for buyers to begin their search.) Ensure also that purchasing agents deal only with product/sales representatives who are knowledgeable in the proper fitting of PPE.
- Be specific about the size requirements of employees when ordering from suppliers.
- Involve workers in the selection of specific models of PPE. Allow workers to try two or three models to determine which offers the best fit and comfort.
- Fit and assign each worker with PPE on an individual basis. Don't assume that "one size fits all."
- Ensure the proper range of sizes are kept in stock at all times.
- View the PPE requirements for proper fit and comfort for female workers as an employment equity issue – there should be adequate and appropriate equipment at the time of hiring.
- Work with joint health and safety committees, health and safety representatives, and union representatives on PPE issues.
- Network with others with similar needs and arrange to purchase collectively where the price of smaller sizes in limited quantities is prohibitive.
- Work with manufacturers in the research and development of products specific to the needs of female employees. (This may be more appropriate for larger employers.)

Unions

The Collective Conscience

The role of unions is as important as that of employers in meeting the needs of women. Union representatives remain vigilant to hazards in the workplace, and strive, through collective bargaining, to control hazards at the source. Also, as more women become unionized, the issues related to women will be better represented.

Unions have shown leadership in the area of occupational health and safety training programs for members. The union representative can be extremely important to women in workplaces that are predominantly male, since women can voice their concerns without fear of retaliation. Union representatives can also act as advocates for women who may tend to put up with unfavorable working conditions.

What Participants Said About Unions

Participants noted several ways in which unions can effectively impact upon the PPE needs of female workers:

- Keep up the pressure through collective bargaining to ensure the correct range of sizes in PPE are available for both women and men on the worksite.
- Ensure that subsidies for work boots, gloves or safety glasses are adequate to provide good quality PPE.
- Encourage members to identify problems, not ignore them or "make do."
- Support employees in their "right to refuse" work without properly fitted PPE.
- Work with employers on locating good quality, reasonably priced PPE that meets the needs of smaller/larger workers.

Joint Health and Safety Committees

Working Together

A joint health and safety committee[1] is made up of people who represent the employees and the employer. Together they share a common goal: to make the workplace healthier and safer.

Joint committees identify potential health and safety problems, bring them to the employer's attention, and recommend solutions.

To carry out their functions, committees must hold meetings and conduct regular inspections of the workplace.

Committees offer the opportunity for dialogue between employees and the employer on workplace health and safety issues, including the selection, use, and maintenance of personal protective equipment. They can play a crucial role by ensuring that appropriate PPE is available when they conduct workplace inspections. Joint committees also promote employee health and safety concerns and investigate serious accidents. As well, during the investigation of a work refusal, a worker member of a committee (or a representative) must be present.

1. By law, a joint health and safety committee is required in any workplace that regularly employs at least 20 workers or where a designated substance regulation applies to the workplace – if there is lead, for instance. Construction projects on which 20 or more workers are regularly employed and which are expected to last three months or longer are also required to have committees. Usually, in workplaces with more than five, but fewer than 20 employees, workers must select one employee as a health and safety representative. Generally speaking, a health and safety representative has the same responsibilities and powers as a joint committee.

What Participants Said About Joint Committees

Participants stressed the value of working with joint health and safety committees, or in smaller workplaces, with health and safety representatives. For committees and representatives, participants suggest the following:

- Recognize that ill-fitting PPE does not protect at all. Moreover, it poses an unnecessary risk to the health and safety of the worker wearing it. It may also pose risks to those working around her (or him).
- Encourage workers (women and men) to voice their concerns about the fit and comfort of their PPE.
- Check that appropriate PPE is provided and worn when conducting workplace inspections. Recognize that PPE may not be worn because it does not fit or is uncomfortable.
- Work together with the employer to resolve PPE problems. Use the directory in this publication to help identify providers of PPE suitable for women.
- Support employees in their "right to refuse" work because of ill-fitting PPE.

Women Who Wear PPE

The Last Word

The women participants we talked to had worked in "non-traditional" occupations from 2 to 16 years, with an average of 8 years experience.

In one-third of the cases, they were the only females in their work area. Seventy-nine per cent (79%) of the women users interviewed belonged to unions. All had access to either a joint health and safety committee or a health and safety representative. Only two of the women were represented by a Women's Committee.

The women were, for the most part, vigilant about protection. In some cases, they had influenced male co-workers to join them in wearing PPE.

And yet, many women who have worked in "non-traditional" occupations for a number of years seem to have given up waiting for improvements in the fit, style and comfort of some of their gear. While some of the women interviewed had taken their concerns to their health and safety committee or representative, or their employer, others had not done so. Most women felt it was more important to "fit in" at the workplace and were therefore reluctant to stand out as being different from male workers.

What Participants Said About Women

Participants had these suggestions about how women who wear PPE can be more effective:

- Be vocal about your needs. Don't be silent or shy: be assertive, less patient and accepting. Be supportive of each other.
- Be pro-active – know your size requirements in all PPE you need to wear. Inform your employer that you need proper fitting PPE to be available when you're hired.
- Shop around; try out different products to assess fit and comfort.
- Network with other women who have similar PPE needs to identify suitable manufacturers and suppliers.
- Voice your concerns about your PPE to your employer or supervisor, joint health and safety committee or health and safety representative, or union.
- Participate in your joint health and safety committee to ensure female workers' needs and concerns are included in discussions and recommendations. Elect representatives who will bring up the needs and concerns of women workers.
- Offer to work with your employer in locating appropriate PPE; use the PPE directory in this publication. Ask to participate in the selection of equipment for female workers.
- Report all hazards (including poor-fitting PPE or PPE that is damaged or worn) to your supervisor or employer.
- Remember, you have the right to refuse to do work that you believe is dangerous either to your own health and safety or to that of another worker.

Summary

Time to Dress For Success

Carpenters, welders, pipe-fitters, woodworkers... women are not new to these jobs. Neither are their special needs for protective equipment. What is new, relatively speaking, is the awareness that women must be fitted, not fit in. Canada's changing workforce (including more middle-aged workers, more women, and an increasing variety of immigrants), as well as new technologies, and employment equity initiatives, all have the potential to influence change.

When it comes to PPE for women, however, change is occurring slowly. Indications are that manufacturers are becoming increasingly aware of a new market with significant sales potential. Still, there are significant gaps in some areas of PPE, such as protective gloves and body suits. Moreover, this project has not attempted to address other areas such as respiratory and fall protection, which at present are less commonly worn by women.

One striking gap, according to the research, appears to be in the communication of product availability. In responding to the survey, manufacturers and suppliers indicated that they had already brought out new styles and designs to accommodate women's needs. Yet, many of the women interviewed had no knowledge of this and were "making do," often with less than adequate protection.

The seriousness of the health and safety issues, resulting from the lack of adequate or appropriate PPE for female workers, is an increasing source of concern. The Industrial Accident Prevention Association and the Ontario Women's Directorate intend this publication and directory to advance the cause of both personal protective equipment and employment equity for women.

Finally, it comes down to the question, who will help make change happen? Government, PPE providers, standards-setting groups, employers, unions, joint health and safety committees, and workers themselves all have a role to play; and all stand to benefit from greater access to proper-fitting PPE.

Glossary

ANSI
American National Standards Institute. A not-for-profit organization that co-ordinates voluntary standards activities, approves standards, represents U.S. interests in international standardization, and provides information and access to the world's standards.

Anthropometry
The science dealing with measurement of the human body to determine similarities and differences among individuals and groups.

CSA
Canadian Standards Association. A not-for-profit organization that develops standards and offers certification-testing.

Ergonomics
An applied science dealing with the characteristics and limitations of people that need to be considered for proper workplace and job design.

Non-Traditional
A term used to refer to those occupations where female participation is less than one third of the total.

PPE
Abbreviation for the phrase "personal protective equipment." Any device worn by a worker to protect against hazards.

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The Project Sponsors: Who We Are and What We Do

The Industrial Accident Prevention Association

The Industrial Accident Prevention Association (IAPA), is a member-driven organization dedicated to helping over 71,000 manufacturing and retail firms in Ontario achieve safe and healthy workplaces. The Association operates on a not-for-profit basis and is funded by Ontario's Workplace Health and Safety Agency.

IAPA's mission is to contribute to the continuous improvement of workplace and workplace-related health and safety by providing high quality, client-focused, educational products, programs and services. These include:

- inquiry and information services
- training
- publications and other print materials
- audio-visuals
- consulting
- conferences.

Volunteer representatives from member companies work in close partnership with the IAPA to develop and deliver generic and industry-specific products, programs and services to their respective memberships.

To better serve Ontario, the IAPA is organized regionally into six districts, composed of 22 divisions or regional volunteer bodies. These groups help deliver workplace health and safety information to the community.

For further information, contact:

Inquiries Service
Industrial Accident Prevention Association
2 Bloor Street West
31st Floor
Toronto, Ontario
M4W 3N8
(416) 965-8888
Toll free: 1-800-387-1210.

The Ontario Women's Directorate Consultative Services Branch

The Ontario Women's Directorate (OWD) is a central agency within the Ontario government, reporting to the Minister Responsible for Women's Issues. Through policy development and review, program co-ordination, consultation and public education, the directorate enables the government to achieve its commitment to the economic, legal, and social equality of women in Ontario. Of particular concern to the OWD are the special needs of aboriginal, racial minority, francophone, immigrant and northern women and women with disabilities.

The directorate's Consultative Services Branch specializes in the area of employment equity. It is responsible for encouraging the planning, development and expansion of employment equity programs in Ontario's private and public sectors.

In order to achieve this goal, the branch provides a wide range of consulting services to employers who are either beginning to initiate employment equity programs or who wish to expand already existing programs. Consultants offer employment equity strategies that are tailored to the organization's particular needs. The services that this branch offers include:

- workshops
- technical guides and information
- videos
- opportunities to exchange ideas with other employers through change agent demonstration projects.

For further information, contact:

Consultative Services Branch
Ontario Women's Directorate
480 University Avenue, 2nd Floor
Toronto, Ontario
M5G 1V2
(416) 597-4500.

Acknowledgements

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We also extend our thanks to Carol Rowntree (preliminary research); Jacqueline Swartz (publication editor); and to the project's coordinators: Teresa Holden, Industrial Accident Prevention Association; and Shirley Fowlin, Ontario Women's Directorate.

The Directory

Where to Find PPE for Women

A Change Agent Project by the Ontario Women's Directorate and the Industrial Accident Prevention Association

Ontario Women's Directorate

The Directory: Where to Find PPE for Women

This directory of providers of personal protective equipment for women is arranged into two sections. The first, an alphabetical listing of manufacturers (***M***) and suppliers (***S***), includes company names and phone numbers, catalogue availability, distribution systems, and initiatives in the area of PPE for women as reported by survey respondents. Where there are no special initiatives mentioned, refer to the second section of the directory – ***Product Listings*** – which begins on page 10.

The second section lists company names alphabetically under product categories within the scope of this project. The categories of protection are also arranged alphabetically. They include:

- body
- eye/face
- foot
- hand
- head
- hearing.

The directory is intended to offer an indication of what PPE is available in women's sizes or in sizes suitable for women. It is not definitive. Moreover, while some verification of survey responses was undertaken, the Industrial Accident Prevention Association and the Ontario Women's Directorate cannot be held responsible for any misrepresentations. Nor can the IAPA/OWD endorse any of the companies listed.

Alberta Glove Co. Ltd.

8912-60 Avenue
Edmonton, Alta. T6E 6A6
Tel: (403) 465-0613
Toll Free: 1-800-661-6564
(Canada only)
Fax: (403) 469-4522
Catalogue available – *M*

Developed women's work and welding gloves, welding garments. Will customize any of their products.

Ansell Canada Inc.

30 boul. de l'Aeroport
Bromont, Que. J0E 1L0
Tel: (514) 534-1850
Toll Free: 1-800-363-8340 (English)
(Canada only)
1-800-363-8341 (French)
Fax: (514) 534-1848
Catalogue available – *M*

All new product launches are in glove sizes 6-11, not the standard M/L in synthetic hand protection (Nitrile, Latex, P.V.C., Neoprene, P.V.A.).

Bashlin Industries Inc.

P.O. Box 867
119 W. Pine Street
Grove City, PA, U.S.A. 16127
Tel: (412) 458-8340
Fax: (412) 458-8342
Catalogue available – *M*

Developed climbers, powerline maintainer belts and harnesses.

Best Glove Mfg. Ltd.

253 Michaud St.
Coaticook, Que. J1A 1A9
Tel: (819) 849-6381
Toll Free: 1-800-567-BEST
(Canada only)
Fax: (819) 849-6120
Distributors across Canada.
Catalogue available – *M/S*

Developed industrial work gloves in women's sizes.

Bettcher Industries, Inc.

P.O. Box 336
Vermilion, OH, U.S.A. 44089-9981
Tel: (216) 965-4422
Toll Free: 1-800-321-8763
(U.S. only)
Fax: (216) 965-4900
Catalogue available – *M*

Bilsom International Ltd.

60 St. Clair Ave. East, Suite 1002
Toronto, Ont. M4T 1N5
Tel: (416) 922-7807
Fax: (416) 922-4616
Distributors across Canada and Safety Supply Canada stores.
Catalogue available – *M*

Bolton Dental Mfg. Inc.

P.O. Box 757
Cambridge, Ont. N1R 5W6
Tel: (519) 622-3770
Fax: (519) 621-0939
Distributed through dental supply outlets across Canada.
Catalogue available – *M/S*

Developed smaller pre-moulded facemasks especially for women, extra small latex gloves, special protective glasses.

Broner Glove & Apparel Company

359 Robbins Dr.
Troy, MI, U.S.A. 48083
Tel: (313) 589-1919
Toll Free: 1-800-521-1318
(U.S. only)
Fax: (313) 583-7724
Catalogue available – *S*

Stocks women's hot mill gloves, non-prescriptive safety glasses.

Cabot Safety Canada Ltd. (formerly AOCO Ltd.)

80 Centurian Drive
Markham, Ont. L3R 8C1
Tel: (416) 795-0700
Toll Free: 1-800-387-4304
(Ontario & Quebec only)
1-800-387-9681 (Rest of Canada)
Fax: (416) 479-4566
Distributors across Canada
Catalogue available – *M*

Developed women's styling/sizing in eye protection.

CleanWear Products Ltd.

705 Progress Avenue, Unit 7
Scarborough, Ont. M1H 2X1
Tel: (416) 438-4831
Fax: (416) 438-4226
Catalogue available – *M/S*

Developed special dresses to protect arms from hot equipment.

Coll Health & Safety Inc.

1260 Fewster Dr., Unit 1
Mississauga, Ont. L4W 1A5
Tel: (416) 625-3994
Fax: (416) 625-6684
Catalogue available – *S*

Stocks hearing protection and some gloves in women's sizes.

Collins Safety Inc.

1200 Meyerside Drive
Mississauga, Ont. L5T 1L2
Tel: (416) 670-1151
Fax: (416) 670-1160
Distributed in stores: Kitchener, Stoney Creek, Barrie, Cambridge, Mississauga, Orillia, Thunder Bay, St. Catharines, Oshawa, Toronto, Peterborough, Kingston, Scarborough and 12 mobile units.
Catalogue available – *S*

Stocks small sized gloves and respirators, women's safety shoes, safety glasses in two sizes, all with significant sales results.

Columbia Fire & Safety Ltd.

3360 Tennyson Ave.
Victoria, B.C. V8Z 3P6
Tel: (604) 386-6773
Fax: (604) 386-3941
No catalogue available – *S*

Stocks eye protection, rubber footwear, work gloves, ear-plugs in smaller sizes.

Comprehensive Loss Management, Inc.

7750 W. 78 Street
Minneapolis, MN, U.S.A. 55439
Tel: (612) 944-1959
Toll Free: 1-800-533-2767
(U.S. only)
Fax: (612) 944-1340
Catalogue available – *S*

Stocks women's sized gloves and back supports.

Degil Safety Products Inc.

6185 Ordan Dr., Unit 9
Mississauga, Ont. L5T 2E1
Tel: (416) 670-2616
Fax: (416) 670-8928
Catalogue available – *S*

Stocks eye, face, hearing, respiratory, and foot protection in size ranges suitable for women. Special emphasis on compatibility of equipment worn with each other.

E.D. Bullard Company

Customer Service Department
Route 7, Box 596
Cynthiana, KY, U.S.A 41031-8822
Tel: (606) 234-6611
Toll Free: 1-800-227-0423
(Canada and U.S.)
Fax: (606) 234-6858
Call toll free for distributors.
Catalogue available – *M*

Developed head protection to fit sizes 6½–8.

Emille Shoes Ltd.

2394 Fairview Street
Burlington, Ont. L7R 2E4
Tel: (416) 632-9688
Fax: (416) 632-9689
Catalogue available – *S*

Stocks women's safety boots/shoes in special widths.

Ergotech Protective Devices Inc.

250 Ferrier St., Unit B
Markham, Ont. L3R 2Z5
Tel: (416) 491-4658
Fax: (416) 475-8767
Distributors across Canada.
Catalogue available – *M*

Developed hand protection and wrist supports.

Hear Saver Limited

183 South Service Road
Grimsby, Ont. L3M 4H6
Tel: (416) 945-2242
Fax: (416) 945-3386
Catalogue available – *M*

Impacto Protective Products Inc.

P.O. Box 524
Belleville, Ont. K8N 5B2
Tel: (613) 966-0062
Fax: (613) 966-0067
Distributed through safety supply stores across Canada.
Catalogue available – *M/S*

Developed women's sized/designed gloves and wrist supports for female factory workers.

Imperial Optical Canada

214 King Street East
Toronto, Ont. M5A 1J8
Tel: (416) 362-2020
Fax: (416) 362-3075
Distributed through local branches.
Catalogue available – *M/S*

Developed women's sizes in safety glasses.

Industrial Textiles Ltd.

200 Clinton Street
Toronto, Ont. M6G 2Y5
Tel: (416) 534-4261
Fax: (416) 534-1830
Catalogue available – *M/S*

Developed industrial work gloves in women's sizes.

ISECO Safety Shoes

2640 Argentia Road
Mississauga, Ont. L5N 6C5
Tel: (416) 542-3300
Fax: (416) 542-3784
Distributed in 15 stores across Canada and 43 mobile units.
Catalogue available – *S*

Worked with manufacturer to design 6" and 8" work boots using women's lasts; also, developed safety walking shoe, and a wider range of sizes/widths in women's footwear.

J.B. Reid Industrial Sales Ltd.

3209 Orlando Drive
Mississauga, Ont. L4V 1A8
Tel: (416) 677-5000
Fax: (416) 677-5016
Distributed in warehouses: Barrie, Peterborough, Scarborough, Mississauga, Guelph, Stoney Creek.
Catalogue available – *S*

Located women's sized carpal tunnel gloves, vibration reducing gloves, and air belts.

Julius Schmid of Canada

34 Metropolitan Road
Scarborough, Ont. M1R 2T8
Tel: (416) 292-9455
Fax: (416) 292-0465
Catalogue available – *M*

Kaufman Footwear

P.O. Box 9005
410 King Street West
Kitchener, Ont. N2G 4J8
Tel: (519) 576-1500
Toll Free: 1-800-265-2635
(Ontario & Quebec)
1-800-265-2158 (Rest of Canada)
Fax: (519) 742-0034
Distributed across Canada.
Catalogue available – *M*

Developed women's sized Kingtread Ultra and safety Sorels; currently developing anti-static footwear and chain-saw boots in women's sizes.

L&L Safety Sales

20 Peel Street
Dundas, Ont. L9H 3E4
Tel: (416) 628-3177
Mobil 577-5685
Catalogue available – *S*

Stocks women's sizes in hand protection, rain-wear, rubber boots, clothing, and ear-plugs.

Lab Safety Supply

P.O. Box 1368
Janesville, WI., U.S.A. 53547-1368
Tel: (608) 754-2345
Toll Free: 1-800-356-0783
(Canada and U.S.)
Fax: 1-800-543-9910
Catalogue available – *S*

Stocks women's sizes in safety footwear, eyewear and hand protection.

Laurentide Gloves Ltd.

255 Montee de Liesse
St-Laurent, Montreal, Que. H4T 1P5
Tel: (514) 345-0135
Toll Free: 1-800-363-2290
(Canada only)
Fax: (514) 342-7263
Distributed through suppliers across Canada.
Catalogue available – *M/S*

Developed women's gloves for general purpose, light, and heavy duty work. Recently added women's sized fire-fighters' gloves and powerline maintainers' gloves.

Lawlor & Co. (Hamilton) Limited

1880 Barton Street East
Hamilton, Ont. L8H 2Y6
Tel: (416) 545-2153
Fax: (416) 545-7336
Distributed at 1880 Barton Street East, Hamilton, Ont. L8H 2Y6
Catalogue available – *S*

Stocks women's safety boots and shoes.

Levitt Safety Limited

2872 Bristol Circle
Oakville, Ont. L6H 5T5
Tel: (416) 829-3299
Toll Free: 1-800-668-6153
(Ontario only)
Fax: (416) 829-2919
Distributed in stores: Toronto, Sarnia, Kitchener, Ottawa, Sudbury, Thunder Bay. Also located Canada-wide. See local directory for listings.
Catalogue available – *S*

Stocks small sized chemical protective gloves and ear-plugs.

Lynn Valley Marketing Inc.

P.O. Box 1272
128 Old Muskoka Road
Gravenhurst, Ont. P0C 1G0
Tel: (705) 687-8816
Fax: (705) 687-4376
Catalogue available – *M*

Developed 'extra small' clothing in several models.

Marzo Glove Company Limited

100 Frederick St. South
Acton, Ont. L7J 2C2
Tel: (519) 853-1780
Fax: (519) 853-1260
Distributed at factory outlet and mobile safety unit.
Catalogue available – *M/S*

Developed all types of hand protection including general purpose, line maintenance operator and chain-saw gloves.

Memphis Glove Co. Ltd.

3420 Pharmacy Ave., Unit 9
Scarborough, Ont. M1W 2P7
Tel: (416) 756-0028
Fax: (416) 756-0041
Catalogue available – *M/S*

MSA Canada Inc.

148 Norfinch Drive
North York, Ont. M3N 1X8
Tel: (416) 667-9400
Fax: (416) 663-5908
Catalogue available – *M/S*

Developed head protection and respirator face-pieces in non-standard sizes to meet needs of customers.

Perfect Fit Glove Co., Inc.

1675 South Park Ave.
Buffalo, N.Y., U.S.A. 14220
Tel: (716) 825-3500
Toll Free: 1-800-245-6837
(U.S. only)
Fax: (716) 825-2252
Catalogue available – *M*

Developed smaller glove sizes with favorable response.

Pioneer Industrial Products

512 East Tiffin Street
Willard, Ohio, U.S.A. 44890
Tel: (419) 933-2211
Toll Free: 1-800-537-2897
(U.S. only)
Fax: (419) 933-2710
Distributed through Safety Supply Canada and Latoplast Ltd., Mississauga, Ont.
Catalogue available – *M*

Ranson Industrial and Safety Supplies Inc.

1166 Michener Rd.
Sarnia, Ont. N7S 4B1
Tel: (519) 332-2220
Fax: (519) 332-3542
Catalogue available – *S*

Stocks women's jumpsuit coveralls, pants, shirts, gloves, and monoframe goggles.

R.B. Clothing Inc.

5357 Decastille
Montreal-Nord, Que. H1G 3E3
Tel: (514) 322-9941
Fax: (514) 322-9787
Catalogue available – *M*

Developed women's sized outside-wear, industrial clothing for utilities workers, policewomen and pilots.

Safe-Pak Supply Canada Inc.

2615 Clarke St.
Port Moody, B.C. V3H 1Z4
Tel: (604) 939-6622
Toll Free: 1-800-665-7233
(Alberta & British Columbia only)
Fax: (604) 939-0016
Distributed by Head Office and six mobile units.
Catalogue available – *M/S*

The Safety Centre Ltd.

1493 Dublin Ave.
Winnipeg, Man. R3E 3G8
Tel: (204) 772-2495
Fax: (204) 775-2650
Catalogue available – *S*

Stocks safety glasses and hearing protectors in variety of styles and sizes.

Safety House Inc.

232 Millway Ave.
Concord, Ont. L4K 3W6
Tel: (416) 660-5800
Fax: (416) 660-5042
Catalogue available – *M/S*

Safety Supply Canada

90 West Beaver Creek Road
Richmond Hill, Ont. L4B 1E7
Tel: (416) 222-4111
Fax: (416) 731-9677
Distributed in 28 stores across Canada.
Catalogue available – *M/S*

Safety Today Inc.

269 Murray St., P.O. Box 1963
Brantford, Ont. N3T 5W5
Tel: (519) 752-9035
Toll Free: 1-800-263-1251
(Ontario only)
Fax: (519) 752-5258
Catalogue available – *S*

Stocks small size half-mask respirators. Free fit, care and maintenance for all respirator purchasers.

Safety World Inc.

720 Progress Ave.
Kingston, Ont. K7M 4W9
Tel: (613) 384-8667
Toll Free: 1-800-267-0541
(Ontario only)
Fax: (613) 384-8060
Distributed in Ontario at 47 Simcoe St. S., Oshawa;
155 Queen St., Ottawa; 41 Dussek St., Belleville.
Catalogue available – *S*

Stocks safety glasses with small temples/bridges, women's gloves, small sized ear protection, correct sizing of clothing for women.

Soucie Salo Safety Inc.

269 Hazel Street
Sudbury, Ont. P3C 1J1
Tel: (705) 674-8092
Fax: (705) 674-3961
No catalogue available – *S*

Stocks work boots, work shirts and pants, and work gloves for women.

The St. George Company Ltd.

206 McPherson School Road
St. George, Ont. N0E 1N0
Tel: (519) 442-2046
Fax: (519) 442-7191
Catalogue available – *S*

Standard Safety Equipment Co.

P.O. Box 188
Palatine, Il., U.S.A. 60078
Tel: (708) 359-1400
Fax: (708) 359-2885
Catalogue available – *M*

Developed chemical-protective clothing.

Stanleykem Inc.

P.O. Box 2099
Cambridge, Ont. N3C 2V6
Tel: (519) 658-9449
Fax: (519) 658-2308
Catalogue available – *M/S*

Distributes directly to customers.

Superior Glove Works Ltd.

36 Vimy Street
Acton, Ont. L7J 1S1
Tel: (519) 853-1920
Fax: (519) 853-4496
Catalogue available – *M/S*

Manufactures over 400 styles of work gloves, most of which are now available in women's sizes and styles.

Tasco Corporation

37 Tripps Lane
East Providence, R.I., U.S.A. 02915
Tel: (401) 438-9200
Toll Free: 1-800-343-2311
(U.S. only)
Fax: (401) 438-0026
Catalogue available – *M*

Developed low profile and lightweight hearing protectors.

Titmus Optical Inc.

1015 Commerce Street
P.O. Box 191
Petersburg, VA., U.S.A. 23804-0191
Tel: (804) 732-6121
Toll Free: 1-800-446-1802
(U.S. only)
Fax: (804) 862-3734
Catalogue available – *M*
Distribution - telephone, mail, local distributors.

Developed zyl and metal protective frames, with and without side shields, in styles and colors for women.

Tucker Industries Inc.

23586 Calabasas Rd., Ste. 206
Calabasas, CA, U.S.A. 91302
Tel: (818) 704-7475
Toll Free: 1-800-786-7287
(Canada and U.S.)
Fax: (818) 348-6231
Toll Free Fax: 1-800-347-6231
(Canada and U.S.)
Catalogue available – *M/S*

Developed oven mitts in three lengths, tapered for greater protection. Offer custom garments at no additional charge.

U.S. Safety

8101 Lenexa Drive
P.O. Box 5965
Lenexa, KA, U.S.A. 66215-5965
Tel: (913) 599-5555
Fax: 1-800-252-5002
(Canada and U.S.)
Catalogue available – *M*

Developed protective eyewear.

WASIP LTD

589 Middlefield Rd., Unit 4
Scarborough, Ont. M1V 4Y6
Tel: (416) 297-5020
Toll Free: 1-800-268-3572
(Canada only)
Fax: (416) 297-0109
Catalogue available – *M/S*

Wayne Safety Inc.

59 Alness St.
Downsview, Ont. M3J 2H3
Tel: (416) 661-1100
Toll Free: 1-800-387-3713
(Ontario only)
Fax: (416) 661-3447
Distributed by Head Office and
13 mobile units.
Catalogue available – *S*

Worked with supplier to develop women's sized foot protection.

Womans Work

P.O. Box 2547
Kennebunkport, ME, U.S.A. 04046
Tel: (207) 967-8800
Toll Free: 1-800-852-3089
(Canada and U.S.)
Catalogue available – *S*

Developed women's pigskin work gloves. Mail order.

WorkAbles for Women

Oak Valley
Clinton, PA, U.S.A. 15026-0214
Tel: (412) 899-3555
Fax: (416) 660-3270
Catalogue available – *S*

Stocks and mail order for a range of clothing and protective equipment for women (safety and sunglasses, boots, gloves).

Working Woman

5334 Yonge Street, Box 2403
North York, Ont. M2N 6M2
Tel: (416) 660-1542
Fax: (416) 660-3270
Catalogue available – *M/S*

Designed coveralls for women with 'drop-seat' feature. Will customize women's workclothes on request.

Body Protection

Alberta Glove Co., Ltd.
welding garments

CleanWear Products Ltd.
disposable coveralls (resistant to dirt, dust, asbestos, PCB, chemicals, ink, lint-free), lab coats, hoods. Custom design on request.

Lynn Valley
nylon coverall rain-wear (sized from petite up), chain-saw chaps, extra heavy fleece sweatshirt with balaclava-style hood, reflective suspenders

MSA Canada Inc.
industrial clothing (e.g., coveralls)

Ranson Industrial and Safety Supplies Inc.
jumpsuit coveralls, pants and shirts

R.B. Clothing Inc.
rain-wear for policewomen and pilots, industrial clothing for utilities workers, specializing in clothing for those working outside (e.g., construction sites)

Safety World Inc.
coveralls and lab coats in Tybek and Polypropylene, welder's pants and jackets

Soucie Salo Safety Inc.
work shirts and pants

Standard Safety Equipment Co.
chemical protective clothing

WorkAbles for Women
bib overalls and pants, rainsuit jackets, rain pants and bib overalls, and other work wear

Working Woman
protective coveralls with "drop-seat" feature, smocks, custom-design clothing on request

Eye/Face Protection

Bolton Dental Mfg., Inc.
impact-resistant glasses

Broner Glove & Apparel Company
ANSI approved impact-resistant glasses and goggles (Willson Safety)

Cabot Safety Canada Ltd.
CSA/ANSI approved impact-resistant glasses and goggles, chemical splash/dust-resistant goggles, headgear (AOSafety Products)

Coll Health & Safety Inc.
CSA approved impact-resistant glasses and goggles, chemical splash/dust-resistant goggles, welding goggles (Cabot, American Optical)

Collins Safety Inc
CSA/ANSI approved impact-resistant glasses

Columbia Fire & Safety Ltd.
CSA/ANSI approved impact-resistant glasses and goggles, chemical splash/dust-resistant goggles (American Allsafe, U.S. Safety)

Degil Safety Products Inc.
CSA/ANSI approved impact-resistant glasses and goggles; prescription safety eyewear, chemical splash/dust-resistant goggles (U.S. Safety)

Imperial Optical Canada
prescription safety eyewear

L&L Safety Sales
impact-resistant glasses, chemical splash/dust-resistant goggles, welding goggles (Jackson, American Allsafe, Norton)

Lab Safety Supply
ANSI approved impact-resistant glasses and goggles, chemical splash/dust-resistant (Crews, Lab Safety, Liberty Optical, Cabot Safety, Bouton, Sellstrom)

Lawlor & Company (Hamilton) Limited
CSA approved impact-resistant glasses

MSA Canada Inc.
CSA/ANSI approved impact-resistant glasses and goggles, chemical splash/dust-resistant goggles, welding goggles; VDT glasses for glare/radiation reduction (MSA, H.L. Bouton Co. Inc.)

Memphis Glove Co., Ltd.
CSA/ANSI approved impact-resistant glasses; ANSI approved impact-resistant goggles and chemical splash/dust-resistant goggles (Crew's)

Ranson Industrial and Safety Supplies Inc.
CSA/ANSI approved impact-resistant glasses; ANSI approved impact-resistant goggles, chemical splash/dust-resistant goggles; monoframe goggles (Cabot, Willson, Isles Optical)

The Safety Centre Ltd.
CSA approved impact-resistant glasses (American Optical)

Safety Today Inc.
CSA approved impact-resistant glasses, 13 styles

Safety World Inc.
CSA approved impact-resistant glasses (American Optical)

Superior Glove
CSA approved impact-resistant glasses (Import)

Titmus Optical Inc.
CSA/ANSI approved impact-resistant glasses, non-prescription; ANSI approved impact-resistant and chemical splash/dust-resistant goggles; prescription safety eyewear

U.S. Safety
CSA/ANSI approved impact-resistant glasses; ANSI approved impact-resistant goggles, chemical splash/dust-resistant goggles

WASIP LTD.
CSA approved impact-resistant glasses and goggles, chemical splash/dust-resistant goggles, welding goggles

WorkAbles for Women
ANSI approved impact-resistant glasses; sunglasses (American Optical)

Foot Protection

Collins Safety Inc.
CSA approved steel-toe boots and shoes, metatarsal guards, thermo-insulated, puncture resistant, chemical resistant; ANSI approved rubber, anti-static

Columbia Fire & Safety Ltd.
CSA approved boots: rubber, chemical resistant

Degil Safety Products Inc.
CSA/ANSI approved steel-toe boots and shoes, rubber chemical resistant (women's sizes in liquid resistant only)

Emille Shoes Ltd.
CSA approved steel-toe boots and shoes, thermo-insulated, slip-resistant, built-in and puncture resistant

ISECO Safety Shoes
CSA approved steel-toe boots and shoes, thermo-insulated, slip-resistant, puncture resistant, rubber boot, non-conductive, chemical resistant, anti-static, non-sparking, metatarsal guards

Kaufman Footwear
CSA approved steel-toe boots in women's sizes 5-11; thermo-insulated footwear, slip-resistant, built-in and puncture resistant - all Grade 1; electrostatic resistant (ESR), metatarsal boots, rubber, chemical resistant

L&L Safety Sales
CSA approved steel-toe boots and shoes, metatarsal guard, thermo-insulated, chain-saw, slip-resistant, rubber boot, conductive, non-conductive, chemical resistant

Lawlor & Co. (Hamilton) Limited
CSA approved steel-toe boots and shoes

Safe-Pak Supply Canada Inc.
CSA approved steel-toe boots and shoes, slip-resistant, rubber, chemical resistant

Safety Supply Canada Ltd.
CSA approved steel-toe boots and shoes, thermo-insulated, slip-resistant, rubber, non-conductive, chemical resistant

Safety Today Inc.
CSA approved steel-toe boots and shoes

Safety World Inc.
CSA approved rubber footwear, steel-toe boots and shoes

Soucie Salo Safety Inc.
CSA approved steel-toe boots and shoes, built-in and puncture resistant shoes, non-conductive boots

Superior Glove
CSA approved rubber boots

Ranson Industrial and Safety Supplies Inc.
CSA approved steel-toe boots, slip-resistant, rubber, chemical resistant; ANSI approved metatarsal guards, conductive, non-conductive

Wayne Safety Inc.
CSA approved steel-toe boots and shoes, metatarsal, thermo-insulated, slip-resistant, puncture-resistant, rubber boots, conductive, non-conductive, chemical resistant, anti-static, non-sparking, chain-saw

WorkAbles for Women
ANSI approved steel-toe boots; ANSI approved thermo-insulated; slip-resistant, rubber

Hand Protection

Alberta Glove Co. Ltd.
gloves: cold work, disposable, dry box, heat resistant, liquid resistant, chemical resistant, materials handling and fire, welding

Ansell Canada Inc.
gloves: abrasion resistant, disposable, heat resistant, liquid resistant, chemical resistant, materials handling

Bashlin Industries Inc.
rubber gloves for electrical work (powerline maintainers)

Best Glove Mfg., Ltd.
gloves: abrasion resistant, cold work, disposable, dry box, liquid resistant, chemical resistant, materials handling, rubber cut resistant

Bettcher Industries, Inc.
metal mesh/cut-resistant gloves and wrist/arm guards (Whizard)

Bolton Dental Mfg., Inc.
gloves: disposable, liquid resistant

Broner Glove & Apparel Company
gloves: abrasion resistant, carpal tunnel, disposable, heat resistant, liquid resistant, chemical resistant, materials handling, vibration reducing

CleanWear Products Ltd.
gloves: abrasion resistant, disposable, heat resistant, liquid resistant, chemical resistant, materials handling, static dissipative

Coll Health & Safety Inc.
gloves: abrasion resistant, carpal tunnel, disposable, liquid resistant, chemical resistant, materials handling, vibration reducing

Collins Safety Inc.
gloves: materials handling

Columbia Fire & Safety Ltd.
gloves: cold work, disposable, dry box, liquid resistant, chemical resistant, materials handling

Comprehensive Loss Management, Inc.
gloves: carpal tunnel, vibration reducing

Ergotech Protective Devices Inc.
gloves: carpal tunnel, vibration reducing

Impacto Protective Products Inc.
gloves: abrasion resistant, carpal tunnel, heat resistant, materials handling, vibration reducing

Industrial Textiles Ltd.
gloves: abrasion resistant, disposable, dry box, liquid resistant, chemical resistant, materials handling

ISECO Safety Shoes
gloves: disposable, materials handling

J.B. Reid Industrial Sales Limited
gloves: abrasion resistant, carpal tunnel, disposable, liquid resistant, chemical resistant, materials handling, vibration reducing

Julius Schmid of Canada
gloves: liquid and chemical resistant

L&L Safety Sales
gloves: abrasion resistant, disposable, heat resistant, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing, T16 welding

Lab Safety Supply
gloves: abrasion resistant, materials handling

Laurentide Gloves Ltd.
gloves: abrasion resistant, cold work, heat resistant, materials handling, welders, powerline maintainers and firefighters

Lawlor & Co. (Hamilton) Limited
gloves: liquid resistant, chemical resistant, cotton, leather palm

Levitt Safety Limited
gloves: carpal tunnel, liquid resistant, chemical resistant, vibration reducing

Marzo Glove Company Limited
gloves: abrasion resistant, carpal tunnel, cold work, disposable, dry box, heat resistant, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, chain-saw, line maintenance operator

Memphis Glove Co. Ltd.
gloves: abrasion resistant, carpal tunnel, disposable, liquid resistant, materials handling

MSA Canada Inc.
gloves: abrasion resistant, disposable, dry box, heat resistant, liquid resistant, chemical resistant, materials handling, cut resistant; glove liners

Perfect Fit Glove Co., Inc.
gloves: abrasion resistant, carpal tunnel, cold work, heat resistant, materials handling, metal mesh/cut resistant, vibration reducing

Pioneer Industrial Products
gloves: abrasion resistant, cold work, disposable, dry box, heat resistant, liquid resistant, chemical resistant

Ranson Industrial and Safety Supplies Inc.
gloves: abrasion resistant, carpal tunnel, cold work, disposable, dry box, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing

The Safety Centre Ltd.
gloves: abrasion resistant, cold work, disposable, liquid resistant, chemical resistant, metal mesh/cut resistant

Safety House Inc.
gloves: abrasion resistant, chemical resistant, materials handling, metal mesh/cut resistant

Safety Supply Canada
gloves: abrasion resistant, disposable, liquid resistant, chemical resistant, cotton

Safety Today Inc.
gloves: abrasion resistant, carpal tunnel, cold work, disposable, heat resistant, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing, cotton with leather face

Safety World Inc.
gloves: abrasion resistant, carpal tunnel, disposable, heat resistant, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing

Soucie Salo Safety Inc.
gloves: abrasion resistant, disposal, liquid resistant, chemical resistant, materials handling

The St. George Company Ltd.
chemical-resistant gloves

Standard Safety Equipment Co.
chemical-resistant gloves

Stanleykem Inc.
gloves: disposable, liquid resistant, chemical resistant

Superior Glove
gloves: abrasion resistant, carpal tunnel, cold work, disposable, dry box, heat resistant, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing, welding

Tucker Industries
Burnguard products for food industry; gloves: abrasion resistant, cold work, heat resistant, liquid resistant, chemical resistant, metal mesh/cut resistant; mitts

WASIP LTD.
gloves: abrasion resistant, carpal tunnel, cold work, disposable, dry box, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing

Wayne Safety Inc.
gloves: abrasion resistant, carpal tunnel, disposable, heat resistant, liquid resistant, chemical resistant, materials handling, metal mesh/cut resistant, vibration reducing

Womans Work
gloves: abrasion resistant, carpal tunnel, cold work, materials handling, metal mesh/cut resistant, vibration reducing

WorkAbles for Women
gloves: cold work, heat resistant, liquid resistant, chemical resistant, materials handling

Head Protection

Cabot Safety Canada Ltd.
CSA/ANSI approved headgear; hoods, liners

Coll Health & Safety Inc.
CSA approved hard hats; bump caps

Columbia Fire & Safety Ltd.
CSA approved hard hats; bump caps

E.D. Bullard Company
CSA/ANSI approved hard hats; helmets, hoods, liners, bump caps

L&L Safety Sales
CSA approved hard hats; bump caps, hoods, liners, hair nets

Lab Safety Supply
ANSI approved hard hats

Lawlor & Co. (Hamilton) Limited
CSA approved hard hats; bump caps

Levitt Safety Limited
CSA approved hard hats

Marzo Glove Company Limited
CSA approved hard hats; bump caps, helmets, hoods, liners

MSA Canada Inc.
CSA/ANSI approved hard hats, helmets; bump caps; custom orders for hoods, liners

Ranson Industrial and Safety Supplies Inc.
CSA approved hard hats; bump caps, hoods, liners

Safe-Pak Supply Canada Inc.
CSA approved hard hats, helmets; bump caps, hoods, liners

Safety Supply Canada
ANSI approved bump caps; CSA/ANSI approved hard hats (sizes 6¼ and up)

Safety Today Inc.
CSA approved hard hats

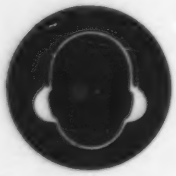
Safety World Inc.
CSA approved hard hats; bump caps, hoods and liners

The St. George Company Ltd.
helmets

Soucie Salo Safety Inc.
CSA approved hard hats

Tucker Industries
flame resistant and liquid resistant hoods and liners

WASIP LTD.
CSA approved hard hats; bump caps, hoods, liners



Hearing Protection

Bilsom International Ltd.
(Ultrasoft, Perfit)

Broner Glove & Apparel Company
(Willson Safety)

Cabot Safety Canada Ltd.
(E-A-R Products)

Coll Health & Safety Inc.
(Bilsom, Siebe North)

Columbia Fire & Safety Ltd.
(American Allsafe)

Degil Safety Products Inc.
(U.S. Safety)

Hear Saver Limited
Health Saver silicone ear-plugs, Hear Saver custom moulding wax ear-plugs, Ear-Mate reversible ear-plugs

L&L Safety Sales
(E-A-R, Arkon)

Lab Safety Supply
(Bilsom, E-A-R)

Levitt Safety Limited
(Howard Leight Products)

MSA Canada Inc.
(MSA Products)

Ranson Industrial and Safety Supplies Inc.
(E-A-R, Bilsom)

The Safety Centre Ltd.

Safety House Inc.
(Safe-Tex Mfg.)

Safety Supply Canada
(E-A-R)

Safety Today Inc.
(North Comfit)

Safety World Inc.
(AOCO, Bilsom, E-A-R)

Tasco Corporation
safety cone plugs, swivelband canal caps, T-100 hearband canal caps

WASIP LTD.
(North, E-A-R, Bilsom)

Wayne Safety Inc.
(Bilsom Products)